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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/667,768	09/22/2000	Yasuo Kobayashi	08038.0043	8178
22852	7590	11/17/2003	EXAMINER	
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 1300 I STREET, NW WASHINGTON, DC 20005			MOORE, KARLA A	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 11/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/667,768	KOBAYASHI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Karla Moore	1763	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 12-16 is/are pending in the application.
- 4a) Of the above claim(s) 8,9 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 12-13, 15-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                   | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)          | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. | 6) <input type="checkbox"/> Other: _____.                                   |

### DETAILED ACTION

The After final amendment filed 21 October 2003 has been received and entered.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3/1 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,913,929 to Moleshi et al. in view of U.S. Patent No. 6,403,925 to Johnsgard et al.

4. Moleshi et al. disclose the invention substantially as claimed and comprising a processing apparatus capable of removing an oxide from a surface of an object to be processed, the processing apparatus comprising: a processing container (10) accommodating the object to be processed therein; an active gas species generating unit (20) for producing active gas species; a heater (36) arranged outside the processing container to heat the object to be processed; a transparent window (42) formed in the processing container between the heater and the object to be processed, the transparent window sheltering the interior of the processing chamber from the outside in an airtight manner (column 4, row 16) and also allowing heating energy from the heater to pass through.

5. However, Moleshi et al. fail to teach a shielding plate provided in such a way that the shielding plate can be inserted into or extracted from a gap between the object and the transparent window;

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wherein, on the condition that the shielding plate is inserted between the object and the transparent window so as to prevent heat a heat stored in the transparent window during a former heating process from being transferred from the transparent window to the object, the processing apparatus is capable of allowing an oxide film formed on the surface of the object to react with the active gas species under unheated condition; thereby forming a product film; and subsequently on condition that the shielding plate is extracted from the gap between the object and the transparent window so as to apply irradiation heat irradiated from the heater to the product film through the transparent window, the processing apparatus is capable of allowing heating a product film to a predetermined temperature for vaporization thereby removing a product film.

6. Johnsgard et al. teach the use of a non-transmissive plate, which is insertable and extractable, for the purpose of covering a window when not in use (column 9, rows 61-67).

7. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an insertable and extractable shield in Moleshi et al. in order to cover the window when not in use as taught by Johnsgard et al.

8. With respect to the method limitations recited in claim 1, Examiner realizes that the prior art fails to teach the claimed inventions intended use of the apparatus. However, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

9. Claims 3/1 is drawn to a chemical species for an intended use of the apparatus, the courts have ruled that expressions relating an apparatus to the contents thereof during an intended operation are of no significance in determining the patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969).

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10. Additionally, with respect to claim 12, which is drawn to an intended method of use the apparatus, the courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

11. Claims 2, 3/2, 5, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,076,205 to Vowles et al. in view of U.S. Patent No. 5,512,320 to Turner et al.

12. Vowles et al. disclose a processing apparatus (Figure 1; column 3, rows 43-50) for removing a film from an object to be processed substantially as claimed, the processing apparatus comprising: a first processing chamber (22) having an active gas species generating unit; a second processing chamber (24) having a heater for heating the object to be processed; and a transporter/transport arm (34; column 2, rows 41-50) for transporting the object between the first processing chamber and the second processing chamber. Although a heater is not explicitly disclosed, it would inherently be a part of a rapid thermal annealing chamber.

13. Vowles et al. disclose the invention substantially as claimed and as described above.

14. However, Vowles et al. fail to teach the transfer chamber connected to a load-lock chamber or a cooling chamber.

15. Turner et al. disclose a transfer chamber (Figure 1, 12) connected to a load-lock/cooling chambers (14A and 14B) for the purposes of evacuating a plurality of substrates (abstract) and providing continuous and rapid flow of substrate processing while allowing adequate time for cooling of substrates; thus, providing an economic and advantageous way of processing (column 2, row 66 through column 3, rows 4).

16. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a load-lock/cooling chamber in Vowles et al. in order to evacuate a plurality of substrates and provided continuous rapid flow of substrate processing while allowing for cooling of substrates as taught by Turner et al.

17. Claim 3/2 is drawn to a chemical species for an intended use of the apparatus; the courts have ruled that expressions relating an apparatus to the contents thereof during an intended operation are of no significance in determining the patentability of the apparatus claim. Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969).

18. With respect to claim 5, Vowles et al. further teach that the transporter (transport arm) is arranged in a transfer chamber (16, 18), which is filled up with a non-reactive gas atmosphere (column 2, rows 49-52).

19. With respect to claim 16, the combination of Vowles et al. and Turner et al. teach that the transporter is arranged in a transfer chamber (16 or 18) connected to the first processing chamber, second processing chamber and the load lock chamber and is also filled up with a non-reactive atmosphere (column 2, rows 51-53).

20. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moleshi et al. in view of Johnsgard et al. as applied to claim 1, 3/1 and 12 above, and further in view of U.S. Patent No. 5,624,499 to Mizuno et al.

21. Moleshi et al. and Johnsgard et al. disclose the invention substantially as claimed and as described above.

22. However, Moleshi et al. and Johnsgard et al. fail to teach a shielding plate provided with a cooler for cooling the shielding plate itself.

23. Mizuno et al. teach cooling a shielding structure within a processing apparatus for the purpose of keeping the structure at a temperature where a film deposition rate is so low that deposition on the shield and the resulting contamination particles are prevented (column 15, rows 54-61).

24. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a cooler for cooling the shielding plate Moleshi et al. and Johnsgard et al. in

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order to prevent unwanted deposition and unwanted deposition particles within the chamber as taught by Mizuno et al.

25. Claims 6/1 and 7/1 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moleshi et al. in view of Johnsgard et al. as applied to claims 1, 3/1 and 12 above, and further in view of U.S. Patent No. 4,952,273 to Popov and U.S. Patent No. 5,830,310 to Doi.

26. Moleshi et al. and Johnsgard et al. disclose the invention substantially as claimed and as described above.

27. However, Moleshi et al. and Johnsgard et al. fail to disclose the apparatus further comprising a plasma generating tube, a plasma gas introducing part, a NF3 gas supplying part, a microwave generating source or a waveguide.

28. Popov teaches the use of a plasma generating tube (50) for the purpose of controlling the size, shape and density of the plasma stream at the sample and to deliver the plasma to the sample without interfering with adjacent equipment (column 4, rows 52-56); a plasma gas introducing part (58) for the purpose of injecting input gases into the source chamber (column 4, rows 64-66).

29. Doi teaches the use of a processing apparatus further comprising a NF3 gas supplying part (18) for the purpose of introducing a gas for in-situ cleaning processing (column 5, rows 29-32).

30. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plasma generating tube in Moleshi et al. and Johnsgard in order to control the size, shape and density of the plasma stream at the sample and to deliver the plasma to the sample without interfering with adjacent equipment as taught by Popov et al. and to additionally provide a plasma introducing part in Moleshi et al. and Johnsgard in order to inject the gases in to the source chamber as taught by Popov et al.

31. It would have been further obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a NF3 gas supplying part in Moleshi et al. and Johnsgard in order to introduce a gas for in-situ cleaning processing as taught by Doi.

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32. With respect to claim 7/1, Popov teaches the use of a wave magnetron for the purpose of generating microwaves (column 3, rows 44-47) and a waveguide for delivering the microwaves to the chamber (abstract).

33. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a wave magnetron and a waveguide in Moleshi et al. and Johnsgard in order to generate microwaves and deliver microwaves, respectively, as taught by Popov.

34. Claims 6/2 and 7/2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vowles et al. in view of Turner et al. as applied to claims 2, 3/2 and 5 above, and further in view of U.S. Patent No. 4,952,273 to Popov and U.S. Patent No. 5,830,310 to Doi.

35. Vowles et al. and Turner et al. disclose the invention substantially as claimed and as described above.

36. However, Vowles et al. and Turner et al. fail to disclose the apparatus further comprising a plasma generating tube, a plasma gas introducing part, a NF<sub>3</sub> gas supplying part, a microwave generating source or a waveguide.

37. Popov teaches the use of a plasma generating tube (50) for the purpose of controlling the size, shape and density of the plasma stream at the sample and to deliver the plasma to the sample without interfering with adjacent equipment (column 4, rows 52-56); a plasma gas introducing part (58) for the purpose of injecting input gases into the source chamber (column 4, rows 64-66).

38. Doi teaches the use of a processing apparatus further comprising a NF<sub>3</sub> gas supplying part (18) for the purpose of introducing a gas for in-situ cleaning processing (column 5, rows 29-32).

39. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plasma generating tube in Vowles et al. and Turner et al. in order to control the size, shape and density of the plasma stream at the sample and to deliver the plasma to the sample without interfering with adjacent equipment as taught by Popov et al. and to additionally provide a plasma introducing part in Vowles et al. and Turner et al. in order to inject the gases in to the source chamber as taught by Popov et al.



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40. It would have been further obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a NF3 gas supplying part in Vowles et al. and Turner et al. in order to introduce a gas for in-situ cleaning processing as taught by Doi.

41. With respect to claim 7/2, Popov teaches the use of a wave magnetron for the purpose of generating microwaves (column 3, rows 44-47) and a waveguide for delivering the microwaves to the chamber (abstract).

42. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a wave magnetron and a waveguide in Vowles et al. and Turner et al. in order to generate microwaves and deliver microwaves, respectively, as taught by Popov.

43. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moleshi et al. and Johnsgard et al. as applied to claims 1, 3/1 and 12 above, and further in view of U.S. Patent No. 5,041,719 to Harris et al. and U.S. Patent No. 4,952,299 to Chrisos et al.

44. Moleshi et al. and Johnsgard et al. disclose the invention substantially as claimed and as described above.

45. However, Moleshi et al. and Johnsgard et al. fail to teach the shielding plate connected to a shaft or a driver arranged outside the processing container for driving the shaft.

46. Harris et al. disclose a shield (37) attached to a shaft (41) and a driver (42) outside the processing apparatus for the purpose of manipulating the shield between a position where it is inserted or extracted (column 6, rows 58-66).

47. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a shaft and driver in Moleshi et al. and Johnsgard et al. in order to insert and extract the shielding plate as taught by Harris et al.

48. Moleshi et al., Johnsgard et al. and Harris et al. disclose the invention substantially as claimed and as described above.

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49. However, Moleshi et al. and Johnsgard et al. and Harris et al. fail to teach a seal for airtight sealing between the shaft and a wall of the processing chamber.

50. Chrisos et al. teach the use of a ferrofluidic seal for sealing a shaft and a wall of a processing chamber for the purpose of maintaining vacuum integrity within the vacuum chamber (abstract).

51. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a seal for sealing the shaft and a wall of the processing chamber in the prior art in order to maintain the vacuum integrity of the vacuum chamber as taught by Chrisos et al.

#### ***Response to Arguments***

52. The 102 rejections of the previous office action have been withdrawn due to amendments made to the claims.

53. Applicant's arguments, filed October 21, 2003, with respect to the rejection(s) of claim(s) 1 and 12 using the references Brors et al. and Johnsgard et al. have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made using Moleshi et al. in view of Johnsgard et al. Brors et al. failed to teach the shielding plate as capable of preventing heat stored in the transparent window from being transferred to an object in the processing chamber (i.e. the plate was thermally conducting rather than insulating), Moleshi et al. remedies this deficiency. Examiner notes that Applicant has misconstrued Examiner's comment regarding the use of Johnsgard et al. in the rejection of the previous office action. For clarification, in the rejection of claims 1 and 12 of the previous office action, Johnsgard et al. was relied upon for teaching the insertion and extraction of a shield during periods of non-use of a transmissive window. This is entirely different than asserting that the reference fails to teach the use of providing a shielding plate preventing heat from passing through a transmissive window. In fact, Johnsgard et al. do in fact teach providing a shielding plate for preventing heat from passing through a transmissive window at column 9, rows 62-67. This teaching is used in the present office action as motivation for the combination of Moleshi et al. with Johnsgard et al. Moleshi et al. teach the use of a window, but are silent on a structure for use when the

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apparatus is to be used without the application of heat. Johnsgard et al. fairly teach the use of a structure for this situation that one of ordinary skill in the art would have recognized.

54. Applicant's arguments filed October 21, 2003 with respect to claim 2 have been fully considered but they are not persuasive. Applicants assert that Turner et al. and Vowles et al. are not combinable because in one paragraph of the abstract Turner et al. mentions the disclosure includes a "method for depositing sequential thin films on glass substrates by single substrate deposition" while in the abstract of Vowles et al. it is indicated that the disclosure is drawn to a "system for multichamber processing of semiconductor wafers providing flexibility in the nature of processing available in a multi processing facility". Examiner notes that the second paragraph of Turner et al. clearly states that a system for carrying out the method is also disclosed. The references are related in that they both are concerned with gas processing of substrates in a cluster tool. Thus, the combination is proper. Motivation for the combination can be found in paragraph 16 of the present office action. The motivation is based on the principle of providing a cluster apparatus capable of performing several processing steps without subjecting a workpiece to the outside environment, which is well known to those of ordinary skill in the art.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km  
13 November 2003

*Primary Examiner*  
*AV 1767*  
*P. Haddonfeld*